



February 17, 2020

Mr. Moshood Oduwole
Remedial Project Manager
US EPA Region III, 3LC20
1650 Arch St.
Philadelphia, PA 19103

Ms. Barbara Brown
Project Coordinator
Maryland Department of the Environment
1800 Washington Blvd.
Baltimore, MD 21230

Re: *MULTIMEDIA CONSENT DECREE JFM-97-558 & JFM-97-559*
 ANNUAL REPORT CALENDAR YEAR 2019

Dear Mr. Oduwole and Ms. Brown:

On behalf of Sparrows Point LLC, enclosed please find the Multimedia Consent Decree Annual Report for 2019. This report provides information and activity progress for 2019 that was accomplished by Sparrows Point LLC, pursuant to Sections VI, XII, and XVIII of the Multimedia Consent Decree.

Please contact me at (314) 620-3056 should questions arise during your review of the enclosed annual report.

Sincerely,

A handwritten signature in cursive script that reads "James Calenda".

James Calenda
Senior Project Manager
Enviro Analytics Group

Enclosure

Multimedia Consent Decree 2019 Annual Report

Prepared for:

U S Environmental Protection Agency

Maryland Department of the Environment

Prepared for:

Sparrows Point, LLC

1600 Sparrows Point Boulevard

Baltimore, MD 21219

February 2020



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1.0 Introduction

The Multimedia Consent Decree (Decree), originally entered into by Bethlehem Steel Corporation (BSC), the U.S. Environmental Protection Agency Region III (EPA) and Maryland Department of the Environment (MDE), defines specific actions required at the Sparrows Point site “Site” located in Baltimore County, Maryland. The Decree became effective on October 8, 1997 (Civil Action JFM-97-558 and JFM-97-559). The Site was purchased by Sparrows Point LLC on September 14th, 2012. A stipulated order implementing modifications to the Decree and transferring the Decree to Sparrows Point LLC was executed on July 28, 2014 (Stipulated Order). A subsequent sale of the real property to Sparrows Point Terminal, LLC was completed on September 18, 2014 subject to the provisions of a purchase and sale agreement wherein Sparrows Point LLC remains responsible for the obligations arising under the Consent Decree. Sparrows Point Terminal, LLC is not a party to the Decree.

Environmental actions for the Site are now being implemented pursuant to the following:

- The Stipulated Order for the Decree entered into by Sparrows Point LLC and the respective agencies effective July 28, 2014;
- Administrative Consent Order (ACO) between Sparrows Point Terminal, LLC and the Maryland Department of the Environment (effective September 12, 2014);
- Settlement Agreement and Covenant Not to Sue (SA) between Sparrows Point Terminal, LLC and the United States Environmental Protection Agency (effective November 25, 2014).

The original Decree for the Sparrows Point Site dealt with many issues associated with iron-making, steel-making, coking, byproduct, plating, and finishing operations. As these operations are no longer conducted, and the associated facilities no longer exist, many specific requirements of the Decree are no longer applicable and have been removed in accordance with the stipulated order implementing modifications to the Decree. In addition, the ACO and SA incorporate relevant ongoing aspects of the Decree by reference.

Specific actions outlined in the Decree include requirements for annual reporting of information and activity progress. This report provides information and activity progress for 2019 that was accomplished by Sparrows Point LLC. There are three sections in the Decree that require annual reporting of information;

Section VI	Paragraph 4	Waste Minimization Plan,
Section XII	Paragraph 5	Notification and Certification of Documents,
Section XVIII	Paragraph 2	Civil Penalties and Pollution Prevention Credits.

Section VI, Paragraph 4, (Waste Minimization Plan), requires a report on the previous year’s status of implementing each Work Plan required under Section VI including sampling data related to hazardous waste regulatory determinations.

Section XII, Paragraph 5, Notification and Certification of Documents, requires a progress report on actions completed as required in Sections V (Corrective Measures Work) and VII (Compliance Requirements) of the Decree.

Annual reports of actual pollution prevention expenditures during the previous calendar year for pollution prevention projects described in Section VI are also required by Section XVIII, Paragraph 2, Civil Penalties and Pollution Prevention Credits.

This Annual Report provides information on actions undertaken in 2019 that comply with the requirements of these three paragraphs. Section 2.0 provides the status on the Waste Minimization Plan required in Section VI of the Decree and includes project cost information for the plan as required in Section XVIII. Sections 3.0 and 4.0 provide progress reports as required in Sections V (Corrective Measures) and Section VII (Compliance Requirements) respectively. Section 5.0 presents other supporting information required in Section XII including spill release reporting and changes to the overall management structure utilized by Sparrows Point LLC to implement the Decree.

2.0 Waste Minimization Plan

As outlined in the Modified Order, obligations associated with Section VI (Waste Minimization Plan) are no longer required with the exception of Section VI, Paragraph 1.b.6 related to maintenance dredging of the Tin Mill Canal. Information associated with this obligation is as follows:

Maintenance Dredging of the Tin Mill Canal

Description of 2019 Activity:

The Maintenance Cleanup Plan for the Tin Mill Canal continued to be implemented during 2019. The remaining 2,400 linear feet of the canal has been dredged and capped as of December 31, 2019. The Decree obligation associated with maintenance dredging is no longer relevant or required.

2019 Expenditures: \$8,062,436.62

3.0 Corrective Measures

Paragraph 5 of Section XII of the Decree requires a description of the work undertaken in Sections V (Corrective Measures) and VII (Compliance Requirements) of the Decree. This section provides a status report for corrective measures projects included in Section V of the Decree as follows:

- Rod & Wire Mill Sludge Bin Remediation Area
- Coke Oven Area Interim Measure
- Site Wide Investigation

Rod & Wire Mill Sludge Bin Remediation Area

Tasks were completed for the Interim Measure at the former Rod & Wire Mill Sludge Bin Storage Area at Sparrows Point during 2019.

After the completion of remediation trenches in 2017, several new groundwater wells were installed in the RWM to facilitate monitoring of the groundwater conditions in the shallow and intermediate zones. Following installation of the remediation trenches, the groundwater wells in the RWM were sampled on a routine schedule to help assess groundwater flow directions and groundwater quality in the shallow and intermediate zones. The groundwater monitoring wells were sampled quarterly throughout 2019.

During 2019 a supplemental investigation was implemented for the RWM along with an off-shore investigation that included the collection of pore water and surface water samples. The objectives of the supplemental investigation were to improve the understanding of groundwater conditions in the RWM, to address the concerns raised by MDE and EPA, and to provide additional investigation data to support the evaluation of the most relevant and effective additional corrective actions for the groundwater conditions at the RWM. The objective of the offshore investigation was to assess whether current groundwater discharges from the RWM could be adversely impacting the offshore environment.

One annual progress report was prepared for the Rod and Wire Mill Interim Measures for Groundwater Remediation at the Tradepoint Atlantic property by ARM Group (ARM) (February 2020). This report presents a brief history of the Rod and Wire Mill Area (RWM), a description of historical interim remedial measures that operated at the RWM, a description of additional remedial work that was completed in 2016 and 2017 to provide soil and groundwater treatment in the RWM area, the resulting changes observed in groundwater flow patterns and contaminant distribution, and an evaluation of the effectiveness of the remedial measures.

Shallow Groundwater Zone

A synoptic round of groundwater level measurements was collected for each of the quarterly sampling events conducted in March, May, September and December 2019. Based on the field measurements, groundwater potentiometric surface maps were constructed for the shallow zone for the May and December events. In the shallow zone, the predominant flow directions are to the west, northwest and southwest off of a mound-like feature extending from east to west. In the northern portion of the Site near the former Northwest Pond groundwater flow is to the north. Groundwater flows south near RWR-MWS. Groundwater flows radially from a ridge-like feature that extends from the east through RW23-MWS.

Measurements of pH in the shallow groundwater zone from the May event, ranged from 4.85 to 12.16. Values of pH were generally higher in wells near the shoreline and closest to the remediation trenches. The two highest pH values, RWJ-MWS and RW24-MWS (12.09 and 12.16 respectively), were observed at the two locations closest to a remediation trench. Additionally, RW16-MWS and RW18-MWS have relatively high pH values and are located downgradient of trenches. The lowest measured pH value (4.85) was at RWR-MWS, located upgradient of the trenches. Low pH was also measured in RWN-MWS and RW14-MWS, both located within the former Sludge Bin Storage Area.

Measurements of pH in the shallow zone from the December event, ranged from 4.95 to 11.49. Like the May event, values of pH were generally higher in wells near the shoreline and closest to the remediation trenches. The two highest pH values were measured in RWJ-MWS and RW24-MWS. Wells RW16-MWS and RW18-MWS also had relatively high pH values. During the December event, the two lowest pH values were measured in RWN-MWS (4.95) and RW14-MWS (4.99), both located within the former Sludge Bin Storage Area.

For the purposes of evaluating trends in groundwater, shallow zone wells have been categorized into four groups. The “perimeter” wells are generally located farthest to west (downgradient). The “interior” shallow wells are located in the central portion of the site. The “delineation” wells are located along the northern boundary of the site. The “upgradient” wells are located farthest upgradient, generally farthest to the east. Well categories are shown in the table below.

Shallow Zone Well Categories			
Perimeter	Interior	Delineation	Upgradient
RW01-MWS	RW09-MWS	RW21-MWS	RW19-MWS
RW02-MWS	RW11-MWS	RWH-MWS	RWR-MWS
RW03-MWS	RW12-MWS	RWI-MWS	RWS-MWS
RW04-MWS	RW14-MWS	RWO-MWS	
RW05-MWS	RW15-MWS	RWQ-MWS	
RW06R-MWS	RW16-MWS		
RW07-MWS	RW18-MWS		
RW08-MWS	RW23-MWS		
RW22R-MWS	RW24-MWS		
RWA-MWS	RW25-MWS		

RWB-MWS	RWJ-MWS		
RWD-MWS	RWK-MWS		
RWE-MWS	RWL-MWS		
RWF-MWS	RWM-MWS		
RWG-MWS	RWN-MWS		

Results for perimeter shallow zone wells show that zinc decreased from December 2018 levels or stayed relatively the same over the course of 2019. The only exception was the concentration in RW22R-MWS. The zinc in this well increased from the May event to the September event. Although it subsequently exhibited a decrease during the December event, it remained at a relatively elevated level. During the December 2019 sampling event, concentrations of zinc in perimeter shallow wells were below the relevant surface water criterion of 81 µg/L in wells RWA-MWS (49.7 µg/L), RWB-MWS (38.7 µg/L), RWD-MWS (5.4 µg/L), RW06R-MWS (4.3 µg/L) and RW05-MWS (41.6 µg/L).

Results for interior shallow zone wells show that, while wells RWN-MWS and RW14-MWS had the highest levels of zinc in the shallow zone, these levels remained relatively stable over 2019. Zinc concentrations in most other shallow interior wells remained relatively stable over the year, except for wells RW09-MWS, RW11-MWS, and RWK-MWS, which exhibited increases over the year. The concentration of zinc in well RW25-MWS exhibited drastic fluctuations including a notable decrease during the December event. The lowest zinc concentration amongst the shallow interior wells during the December 2019 sampling event was detected in RW24-MWS at a concentration of 6.7 µg/L.

Zinc concentrations in delineation wells generally remained stable from the May 2019 event through the December 2019 event (all wells in this category were installed in April 2019). The only exception is RW21-MWS, the former NAPL monitoring well. This well was originally installed to monitoring NAPL but was sampled in the last three 2019 events to provide additional delineation in the former Northwest Pond former source area. RW21-MWS exhibited higher zinc concentrations during the September 2019 and December 2019 events.

While the zinc concentrations in upgradient shallow zone wells RW19-MWS and RWS-MWS generally decreased over 2019, new supplemental upgradient well RWR-MWS exhibited elevated levels and increases during the September and December events.

Results for perimeter shallow zone wells show that total cadmium decreased or stayed relatively stable during the 2019 events. During the December 2019 sampling event, concentrations of cadmium in perimeter shallow wells were below the relevant surface water criterion of 7.9 µg/L, except for RW03-MWS (18.8 µg/L) and RW22R-MWS (70.4 µg/L). Cadmium was not detected in several of the shallow perimeter wells during the 2019 events. Since February 2017, cadmium concentrations in perimeter wells generally seem to be remaining stable or decreasing over time.

Sampling results for interior shallow zone wells show that total cadmium was generally below 20 µg/L during 2019, except for in RW14-MWS and RWN-MWS. Both of these wells are located within the former Sludge Bin Storage Area. Well RW14-MWS continues to have the highest levels of cadmium in the

shallow zone, with a concentration that was three orders of magnitude greater than concentrations in the majority of shallow zone wells. The second highest concentration (lower but elevated compared to other shallow zone wells) was nearby at RWN-MWS (11,200 µg/L during the December 2019 sampling event).

Cadmium concentrations in delineation wells generally remained stable from the May 2019 event through the December 2019 event (all wells in this category were installed in April 2019). The only exception is RWI-MWS, which exhibited increases during the September and December events.

Cadmium was generally not detected in upgradient shallow zone wells RW19-MWS and RWS-MWS during 2019 but was detected in new supplemental well RWR-MWS. However, this well did exhibit an overall decrease from the May 2019 event to the December 2019 event.

Intermediate Groundwater Zone

A synoptic round of groundwater level measurements was collected for each of the quarterly sampling events conducted in March, May, September, and December 2019. Based on these field measurements, groundwater potentiometric surface maps were constructed for the intermediate zone for the May and December events. The potentiometric surface in the intermediate zone is nearly flat, with hardly any variation (less than a half foot of difference) amongst most calculated groundwater elevations across the Site. Wells RW18-MWI and RW19-MWI had notably higher groundwater elevations in the December event than in the May event. Groundwater elevations in the intermediate zone are generally lower than in the shallow zone, indicating a downward vertical gradient, except to the southwest near the shore at well pairs RWF and RWG. In these well pairs, the water levels are higher in the intermediate wells than in the shallow wells, indicating an upward gradient in this area.

Intermediate groundwater zinc concentrations during the May 2019 event generally decrease from east to west across the Site. Zinc concentration was highest in and around the former East Pond source area, with RW19-MWI measuring 7,280,000 µg/L. Zinc concentrations are above 600,000 µg/L in RW21-MWI and RWI-MWI, which indicates that the contaminant plume in the intermediate zone extends beyond the northern limits of the treatment trenches and that the former Northwest Pond source area may have acted as a source of contaminant mass to the intermediate zone groundwater. An elevated concentration was also observed in RWA-MWI. Based on the low concentration in RW22R-MWI, the relatively high zinc concentration in RWA-MWI appears to be an isolated plume separated from the high concentrations noted around the former Northwest Pond source area. At RWJ-MWI, zinc concentrations are relatively low (1,580 µg/L) in the groundwater in the final remediation trench. However, concentrations of zinc above 100,000 µg/L extend westward along an axis from RWL-MWI, downgradient of the westernmost treatment trench, to RWE-MWI. Elevated zinc levels in the perimeter wells along the shoreline are bounded to the south by a low concentration observed in RWG-MWI.

Intermediate zone groundwater zinc concentrations during the December 2019 event reveal nearly the same distribution of zinc as the May 2019 event. Zinc concentration was still the highest in the former East

Pond source area at RW19-MWI, but RWR-MWI (to the south) exhibited a level closer to that of RW19-MWI during this event. Concentrations in the former Northwest Pond source area (RW21-MWI and RWI-MWI) were slightly lower but still above 500,000 µg/L. The zinc concentration in RW13-MWI, within the former Sludge Bin Storage Area, was more than three orders of magnitude higher in December than during the May event. The isolated plume in the northwest corner near RWA-MWI persists, as well as the axis of concentrations above 100,000 µg/L extending from RWL-MWI eastward to RWE-MWI. The elevated zinc levels in the perimeter wells along the shoreline are still bounded to the south by a low concentration observed in RWG-MWI during the December 2019 event.

Intermediate zone cadmium concentrations during the May event vary significantly across the Site. The highest cadmium concentration was measured in RWI-MWI, located to the north of the western-most remediation trench, within the former Northwest Pond source area. There are also relatively high concentrations southwest of the western-most trench at RW23-MWI (2,270 µg/L) and RW05R-MWI (2,570 µg/L). The extent of the elevated cadmium is limited to the south by relatively low concentrations observed in wells RW01-MWI and RWG-MWI. As with zinc, the high cadmium detection at the northwestern-most corner of the Site at RWA-MWI (6,830 µg/L) appears to be isolated from the known source areas.

Intermediate zone cadmium concentrations during the December event are similar to those observed during the May event. Like the zinc concentration, the cadmium concentration in RW13-MWI was almost three orders of magnitude higher in the December event. The concentration in RWH-MWI, north of the former Northwest Pond, was more than an order of magnitude higher, while the concentration in RWP-MWI, north of the East Pond, also increased significantly. Relatively high concentrations southwest of the western-most trench at RW23-MWI and RW05R-MWI persisted to the December event, as well as the isolated plume in the northwest corner at RWA-MWI.

Measurements of pH within the intermediate zone during the May event are generally less variable in comparison to the shallow zone but exhibit a similar spatial distribution. The two highest pH values (10.25 and 9.88) are located at RW13-MWI and RW16-MWI. Both wells are located directly downgradient of remediation trenches. The three lowest pH values (5.19, 5.23, and 5.24) were measured at RWP-MWI, RW19-MWI and RWR-MWI, located in or near the former East Pond source area.

Measurements of pH within the intermediate zone during the December event were generally similar to those measured during the May event, with a few exceptions. The two locations that had the highest pH values in the May event, RW13-MWI and RW16-MWI, had notably lower pH values during the December event. Well RWJ-MWI (installed within a remediation trench) exhibited the highest pH value during this event, at 8.15. The lowest pH value during this event, 4.96, was measured at RWP-MWI. Toward the west, wells RW07-MWI and RWD-MWI exhibited higher pH relative to the May event.

For the purposes of evaluating trends in groundwater, intermediate zone wells have been categorized into four groups based on their location. The “perimeter” wells are generally located farthest to west. The “performance” wells are located in the central portion of the site. The “delineation” wells are located along the northern boundary of the site, north of the remediation trenches. The “upgradient” wells are located farthest upgradient, generally farthest to the east. Well categories are shown in the table below.

Intermediate Zone Well Categories			
Perimeter	Performance	Delineation	Upgradient
RW01-MWI	RW09-MWI	RW21-MWI	RW19-MWI
RW02-MWI	RW10-MWI	RWH-MWI	RWR-MWI
RW03-MWI	RW11-MWI	RWI-MWI	RWS-MWI
RW05R-MWI	RW12-MWI	RWO-MWI	
RW06-MWI	RW13-MWI	RWP-MWI	
RW07-MWI	RW15-MWI	RWQ-MWI	
RW08-MWI	RW16-MWI		
RW22R-MWI	RW18-MWI		
RWA-MWI	RW23-MWI		
RWB-MWI	RW24-MWI		
RWD-MWI	RW25-MWI		
RWE-MWI	RWJ-MWI		
RWF-MWI	RWK-MWI		
RWG-MWI	RWL-MWI		
	RWM-MWI		

While concentrations of zinc in some perimeter wells remained stable over 2019, concentrations in the majority of perimeter wells exhibited overall increases over the course of 2019. Furthermore, concentrations in RW02-MWI, RW03-MWI, RW06-MWI, and RW07-MWI exhibited notable increases compared to concentrations measured in 2017. Zinc in RW01-MWI was measured at lower levels in 2019 than in 2017 and zinc in RW08-MWI has exhibited significant decreases from levels measured in 2018. During the December 2019 sampling event, zinc concentrations in the perimeter intermediate wells were below the relevant surface water criterion of 81 µg/L in RWB-MWI (47.8 µg/L) and RW08-MWI (48.9 µg/L) and above the criterion in the all other perimeter wells. The highest zinc concentration amongst perimeter wells in 2019 was consistently measured in well RWA-MWI.

Results for performance intermediate zone wells showed that zinc concentrations fluctuated in 2019 in wells RW13-MWI and RW25-MWI. Besides RW25-MWI, new supplemental wells have generally been relatively stable or decreased over 2019. RW15-MWI exhibited an overall increase over the course of 2019, with concentrations notably higher than in 2017. Concentrations of zinc in RW09-MWI and RW18-MWI in 2019 are slightly higher than average concentrations from 2017. In wells RW10-MWI, RW11-MWI, RW12-MWI, and RW16-MWI, concentrations in 2019 were notably lower than they were in 2017. Zinc concentrations in delineation wells mostly exhibited overall decreases from the May 2019 event to the December 2019 event, except for RWH-MWI and RWP-MWI which exhibited increases. The levels observed in RWP-MWI are particularly elevated and are continuing to increase. The zinc concentration in upgradient intermediate zone well RW19-MWI fluctuated over 2019 but has generally remained relatively the same concentration since February 2017. New supplemental upgradient well RWR-MWI exhibited increases during the September 2019 and December 2019 events, while RWS-MWI remained relatively stable. RW19-MWI well typically had the highest zinc concentration of all upgradient intermediate wells.

Concentrations of cadmium in perimeter wells generally remained relatively stable or increased over the course of 2019. Concentrations of cadmium in perimeter intermediate wells were below the relevant surface water criterion of 7.9 µg/L in wells RWB-MWI, RW22R-MWI (not detected in either well), and RW08-MWI. The highest cadmium concentration in perimeter wells in 2019 was consistently measured in well RWA-MWI. Wells RW02-MWI, RW03-MWI, RW06-MWI, and RW07-MWI exhibited notable increases in cadmium in 2019 compared to 2017 levels. However, 2019 cadmium concentrations for RW01-MWI exhibited notable decreases compared to its 2017 levels and RW08-MWI exhibited notable decreases compared to its 2018 levels.

While concentrations of cadmium in a few intermediate performance wells remained relatively stable, the majority of concentrations in performance wells exhibited increases during 2019. Well RW13-MWI had the highest level of cadmium in the intermediate performance wells in the March and December events, but had much lower concentrations during the May and September events, comparable or lower than those of other intermediate performance wells. Cadmium concentrations were 13.9 µg/L or below in RW09-MWI, RW10-MWI, and RW16-MWI during 2019. The cadmium concentrations in RW15-MWI were notably higher in 2019 than levels observed in 2017, while concentrations in RW18-MWI were consistent with levels observed in 2017. However, in wells RW09-MWI, RW10-MWI, RW11-MWI, RW12-MWI, and RW16-MWI, 2019 cadmium concentrations were notably lower than those observed in 2017. Cadmium concentrations in intermediate delineation wells either remained relatively stable or increased from the May 2019 event to the December 2019 event. Wells RWH-MWI and RWP-MWI exhibited increases during both the September and December events.

Cadmium concentrations in upgradient intermediate zone well RW19-MWI remained relatively stable over the course of 2019 but have exhibited an overall decrease from the beginning of post-trench monitoring in February 2017. Concentrations in new supplemental upgradient well RWR-MWI increased during the September 2019 and December 2019 events, but remained below those of RW19-MWI. Cadmium was typically not detected in well RWS-MWI in 2019.

Coke Oven Area Interim Measures

Interim measures (IMs) have been developed to address identified environmental conditions at the Coke Oven Area (COA) Special Study Area in accordance with the United States Environmental Protection Agency's (US EPA)'s September 2, 2010 letter. The following designations identify the operating IM "Cells" at the COA:

- Cell 1: Air Sparge/Soil Vapor Extraction (AS/SVE) System in the Former Benzol Processing Area,
- Cell 2: Air Sparge/Soil Vapor Extraction (AS/SVE) System in the shallow groundwater zone, groundwater pump and treat (GW P&T) system in the intermediate zone, Former Coal Basin Area,
- Cell 3: AS/SVE System in "Cove" Area,
- Cell 5: Dual Phase Extraction (DPE) system for the shallow zone, "Turning Basin" side of former Coke Oven Area,
- Cell 5: Dense Non-Aqueous Phase Liquid (DNAPL) Recovery
- Cell 6: Light Non-Aqueous Phase Liquid (LNAPL) Recovery at the Former Benzol Processing Area.

As of the end of 2018, Cells 1, 2, 3, 5 and 6 remediation systems are operational.

CELL 1

The air sparge/soil vapor extraction (AS/SVE) system in the Former Benzol Processing Area (Cell 1) operated from January 4th through the end of the year, removing an estimated 1,326 pounds of hydrocarbons from the shallow groundwater zone, compared to the 1,076 pounds removed in 2018. The system experienced intermittent downtime throughout the year due to various maintenance issues. The concentrations of total volatile organic compounds (VOCs) in groundwater at two monitoring wells exhibited relatively stable trends in concentration during 2019. The total VOCs at the third monitoring well exhibited a spike in concentration by the June sampling event coincident with AS/SVE system downtime. This AS/SVE system should continue to be operated and monitored in accordance with current practices, with attempts to minimize system downtime.

CELL 2

Cell 2 includes an AS/SVE system for the shallow zone groundwater and a groundwater pump and treat (GWPT) system for the intermediate zone groundwater beneath the Former Coal Basin Area. The AS/SVE system was not operated in 2019 because components of the vapor extraction trench were submerged in water due to much higher than normal groundwater elevations due to historically high rainfall volumes in 2018 and early 2019. Since 2014, total VOC concentrations in shallow zone groundwater have remained relatively stable or slightly decreased. The GWPT system was consistently operated through 2019 resulting in the removal of approximately 5,800 pounds of VOCs from the Cell 2 intermediate groundwater zone, as compared to approximately 2,700 pounds removed during the previous year. By the end of 2019, total VOC concentrations in intermediate zone groundwater within the two wells with the highest total VOC concentrations decreased to approximately 32% or less of the

peak concentrations that were observed in these wells in September/November 2015. Between September 2014 and September 2017, the total VOC concentrations at all other intermediate zone wells decreased and since 2017 have shown stable or decreasing trends.

CELL 3

The AS/SVE system for the shallow zone groundwater in Cell 3 operated for approximately 4,800 hours in 2019, removing an estimated 30 pounds of hydrocarbons, compared to 151 pounds removed in 2018 with comparable operating time. Total VOC concentrations in one of the four Cell 3 area groundwater monitoring wells have remained relatively stable during the past two years, while slightly decreasing trends have occurred in three of the four monitoring wells. Because hydrocarbon recovery has been below expectations, the AS/SVE program at Cell 3 will be evaluated to determine what modifications or alternative methods are warranted to attain remedial action objectives. Until that time, the current system will be operated with focused attention to select portions of the local VOC plume.

CELL 5

Cell 5 includes a dual-phase extraction (DPE) system and a Dense Non-Aqueous Phase Liquid (DNAPL) recovery system for the shallow zone groundwater in the "Turning Basin" side of the former Coke Oven Area. These systems operated for the majority of the year, resulting in the removal of approximately 3,400 pounds of hydrocarbons from the Cell 5 area. This is consistent with the 3,762 pounds removed a year prior, with the majority of the mass being removed by the DNAPL recovery system. The DPE system will be evaluated to determine what modifications or alternative methods are warranted to attain remedial action objectives. Until then, the existing system will continue to be operated and monitored in accordance with current practices.

CELL 6

Cell 6 consists of a Light Non-Aqueous Phase Liquid (LNAPL) Multi-Phase Extraction (MPE) monitoring and recovery system at the Former Benzol Processing Area, which is supplemented by manual bailing and skimming of LNAPL. These remedial efforts removed approximately 16,000 pounds of LNAPL during 2019 (compared to approximately 11,000 pounds removed in 2018), with a cumulative removal amount of 162,872 pounds since LNAPL recovery was started in July 2010. In response to the reinjection wells showing a decreased ability to accept discharged groundwater from the MPE system by the end of 2019, new reinjection wells have been constructed to accommodate continued MPE operation. In addition, the MPE system will be evaluated to determine what modifications or alternative methods are warranted to attain remedial action objectives. LNAPL thickness should continue to be measured throughout 2020 and the data used to identify areas that may require more intense remedial efforts.

SUMMARY

The IMs at the former COA were operated during 2019 in accordance with the operating plans, with the exception of the AS/SVE system in Cell 2. This system was shut down in April 2018 in response to shallow groundwater submergence of the SVE recovery trench due to historically high rainfall volumes in 2018 and early 2019 and did not operate during 2019. Based on the estimated hydrocarbon removal amounts from the remedial activities at Cells 1, 2, 3, 5, and 6, a total of approximately 26,560 pounds of hydrocarbons were removed from the Coke Oven cells in 2019, showing an increase in removal when compared to the 18,700 pounds that were removed in 2018.

Based on the results of monitoring data collected at the COA during 2019, it is recommended that the frequency of groundwater monitoring be reduced from quarterly sample collection to semi-annual sample collection. The existing IMs at all cells will be evaluated as described in the CMS Work Plan (ARM 2019) to determine modifications or alternative methods necessary to attain remedial objectives.

During 2019 a supplemental investigation was implemented for the COA along with an off-shore investigation that included the collection of pore water and surface water samples. The objectives of the supplemental investigation were to define the nature and extent of groundwater impacts in the COA, to address the concerns raised by MDE and EPA, and to provide additional investigation data to support the development of a Corrective Measures Study Work Plan to address groundwater conditions in this area. The objective of the offshore investigation was to assess whether current groundwater discharges from the COA could be adversely impacting the offshore environment.

Site Wide Investigation

Environmental responses, including Consent Decree obligations for Site Wide Investigation, for the Site are being implemented pursuant to the following:

- Multimedia Consent Decree between Bethlehem Steel Corporation, the United States Environmental Protection Agency, and the Maryland Department of the Environment (effective October 8, 1997); this Consent Decree has been modified in accordance with a stipulated order entered into by Sparrows Point LLC and the respective agencies effective July 28, 2014
- Administrative Consent Order (ACO) between Sparrows Point Terminal, LLC and the Maryland Department of the Environment (effective September 12, 2014);
- Settlement Agreement and Covenant Not to Sue (SA) between Sparrows Point Terminal, LLC and the United States Environmental Protection Agency (effective November 25, 2014).

Regulatory obligations for investigation, remediation, pathway exclusion, and closure of applicable areas of the Site are addressed within the ACO and EPA Agreement. As described within the ACO, Phase II investigations will be conducted and Work Plans will be developed for Site. Regulatory obligations and closure will be conducted in accordance with the terms of the Regulatory Agreements, which include obtaining a Certificate of Completion under MDE's Voluntary Cleanup Program and an EPA Certificate of Completeness after the BSC Consent Decree Areas proceed through RCRA's Statement of Basis process upon which a Final Decision and Response to Documents is rendered.

Certain portions of the Site have been defined as Area A and have been designated for investigation, remediation, and/or development on a priority basis as defined in the ACO. To delineate Area A in accordance with the ACO, Sparrows Point Terminal, LLC (now Tradepoint Atlantic) submitted a VCP application for Area A on September 10, 2014.

Work plans to investigate the site were initiated in 2019 and submitted for approval in accordance with the requirements and schedule outlined in the ACO and SA. Phase II work plans and Response and Development Work Plans were submitted in 2019 for the following parcels and areas, please refer to the attached figure for parcel area definition:

- Parcel A-4 Phase II Investigation Report (Rev3)
- Parcel A-5 Phase II Investigation Report (Rev0)
- Parcel A-7 Phase II Investigation Report (Rev1)
- Parcel A-9 Phase II Investigation Report (Rev0)
- Parcel A-10 Phase II Investigation Report (Rev1)
- Sub-Parcel A11-1 Response and Development Work Plan (Rev2, Rev3, & Rev4)
- Parcel A-13 Phase II Investigation Report (Rev0)
- Parcel A-17 Phase II Investigation Work Plan (Rev0)

- Parcel A-18 Phase II Investigation Work Plan (Rev0)
- Sub-Parcel B1-2 Response and Development Work Plan (Rev0, Rev1, Rev2, & Rev3)
- Sub-Parcel B1-1 Response and Development Work Plan (Rev0, Rev1)
- Parcel B-1 Phase II Investigation Report (Rev1)
- Sub-Parcel B2-2 Response and Development Work Plan (Rev1 & Rev2)
- Sub-Parcel B2-1 Response and Development Work Plan Addendum
- Parcel B-4 Phase II Investigation Report (Rev1)
- Parcel B-5 Phase II Investigation Report (Rev2 & Rev3)
- Parcel B-6 Phase II Investigation Report (Rev2)
- Sub-Parcel B6-2 Response and Development Work Plan Addendum Modification
- Parcel B-17 Phase II Investigation Report (Rev1)
- Parcel B-20 Phase II Investigation Work Plan
- Parcel B-22 Phase II Investigation Report (Rev1)
- Parcel B-23 Phase II Investigation Report (Rev0)
- Parcel B-24 Phase II Investigation Work Plan (Rev0 & Rev1)

4.0 Compliance Requirements

As outlined in the Modified Order, obligations associated with Section VII (Compliance Requirements) are no longer required with the exception of Section VII.C. related to compliance requirements for the operation of Coke Point and Greys Landfill. Information associated with this obligation is as follows:

Coke Point and Greys Landfill Operation

Activities conducted in 2019 for the landfills were as follows:

Coke Point Landfill

The Coke Point Landfill is currently not being utilized for the management of non-hazardous waste materials. Waste materials have not been received at this landfill since the change in ownership from RG Steel Sparrows Point LLC to Sparrows Point LLC in 2012. The plan for Coke Point Landfill is to continue to use the facility for slag storage and tenant scrap metal recycling and iron bearing material recovery operations.

Control of Landfill Access and Activities

Access control berms and a gate access structure are installed at Coke Point Landfill to mark the boundaries of the landfill and to prevent unauthorized access. Access control berms were upgraded in 2013 and placed around the perimeter of the landfill and are of sufficient height and grade to prevent vehicular access. The access control structures are being maintained as part of the current compliance actions for the landfill.

Specific measures are being conducted to prevent unauthorized waste disposal at the landfill and include the following:

- Coke Point Landfill is located within the Sparrows Point site which currently has access control restricted to owners of the facility, demolition and scrap management operations and tenant operations. Access control includes security personnel at three operating gates to the facility and routine perimeter security patrols and inspections. Entities that have access to the site have been informed of the status of Coke Point Landfill and the restriction on future waste placement.

Groundwater Monitoring Program

Groundwater monitoring was conducted at Coke Point Landfill in 2019 in accordance with a request received from the Maryland Department of the Environment on December 3, 2012. Semi-annual sampling events were completed in the 2nd and 4th quarters of 2019. A semi-annual groundwater monitoring report providing data analysis and results consistent with normal practices of the Department for landfill groundwater compliance monitoring programs will be submitted in 2020.

The reports include summaries of the following data collection activities:

- water level measurements in monitoring wells;
- sampling of monitoring wells; and
- laboratory analysis of monitoring well samples.

Greys Landfill

The landfill continues to operate in accordance with the approved landfill operations and engineering plan. The current systems are being maintained at the landfill; maintenance activities completed in 2019 included the following:

- Vegetation and tree growth have been removed as necessary within swales, the sediment basin and other control features at the landfill;
- Maintenance of haul roads;
- The soil stockpile area has been graded and seeded;
- Side slopes have been graded and seeded to provide interim cover above elevation 110';
- As-built plans for the sediment control basin have been reviewed to document that adequacy of the current performance of the sediment control basin.

Groundwater Monitoring Program

Groundwater monitoring was conducted at Greys Landfill in 2019 in accordance with a request received from the Maryland Department of the Environment on December 3, 2012. Semi-annual sampling events were completed in the 2nd and 4th quarters of 2019. A semi-annual groundwater monitoring report providing data analysis and results consistent with normal practices of the Department for landfill groundwater compliance monitoring programs will be submitted in 2020.

The reports include summaries of the following data collection activities:

- water level measurements in monitoring wells;
- sampling of monitoring wells; and
- laboratory analysis of monitoring well samples.

5.0 Decree Management Reporting

Project Management

The US EPA and MDE were informed of the ownership change of the facility from Sparrows Point LLC to TradePoint Atlantic (formerly Sparrows Point Terminal, LLC) on September 18, 2014. As noted previously, ongoing obligations of the Consent Decree remained with Sparrows Point LLC as part of the purchase and sale contract between Sparrows Point LLC and TradePoint Atlantic.

Notification to the U. S. Environmental Protection Agency and the Maryland Department of the Environment is hereby provided that the Project Coordinator responsible for the referenced Consent Decree is:

Mr. James Calenda,
Sparrows Point, LLC
1515 Des Peres Road, Suite 300
St. Louis, MO 63131
Phone: (314) 620-3056

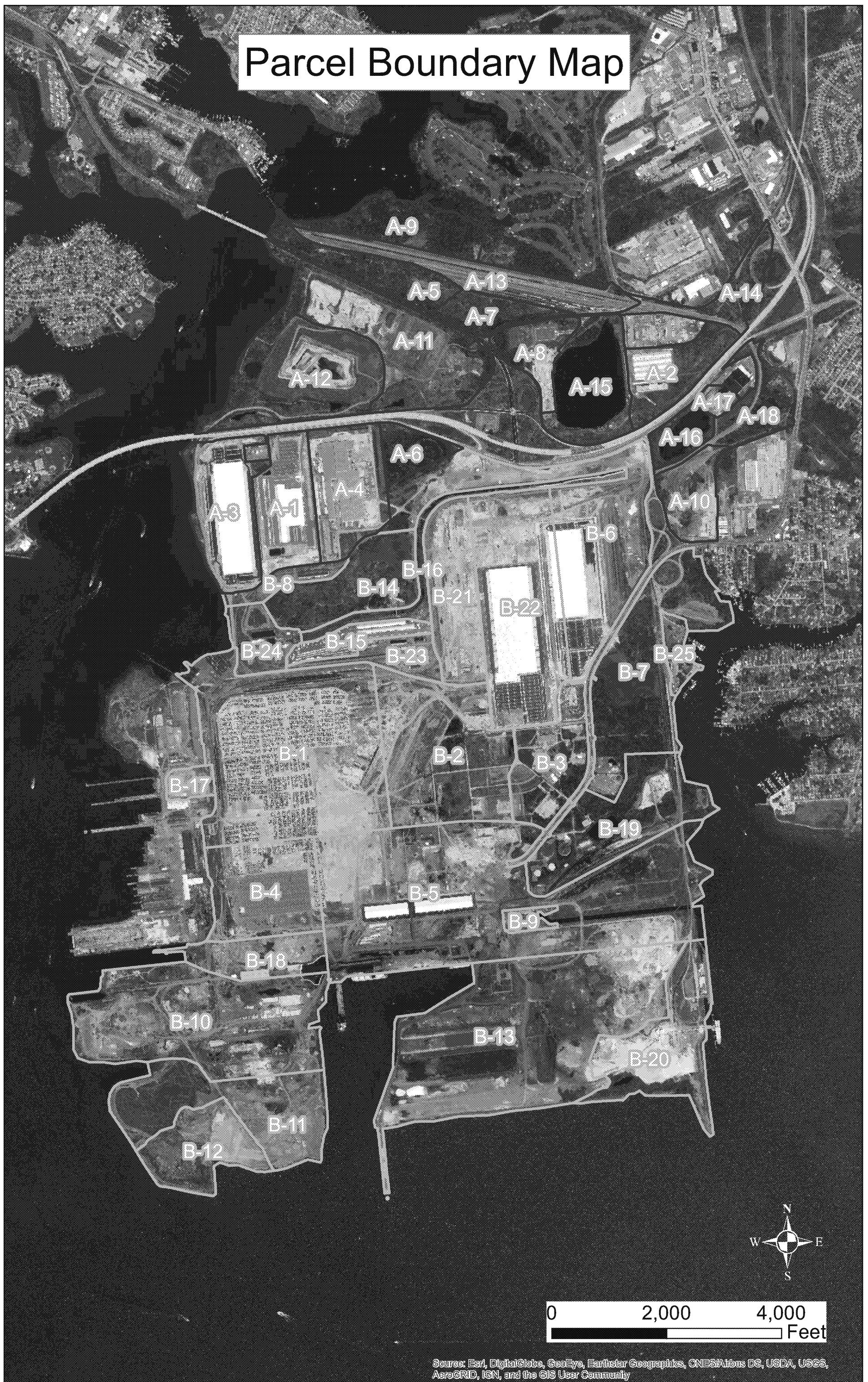
e-mail: jcalenda@enviroanalyticsgroup.com

Communications between or among the parties, and documents, reports, approvals and other correspondence concerning the activities performed pursuant to the terms and conditions of the Consent Decree shall be directed to Mr. Calenda. Copies of all documents to be submitted to Sparrows Point, LLC shall be sent to the Project Coordinator.

Release Reporting

Non-aqueous phase liquid was identified in groundwater wells installed as part of the Phase II Investigation for parcel B-4. The presence of this liquid was reported to the agencies in 2019 and monitoring programs are underway. There were no other releases, including spills or other events that occurred at the Facility in 2019 that were required to be reported to the Agencies.

Parcel Boundary Map



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community